CLAIMS

What is claimed is:

1. A method of shrinking a film comprising the steps of:

providing a film comprising one or more thermoplastic polymers and at least about 0.001 weight % of single-walled carbon nanotube material based on the weight of the film, wherein the film has a free shrink at 185°F in at least one of the machine or transverse directions of at least about 5% measured according to ASTM D 2732; and

exposing the film to an amount of radiation energy effective to activate the shrink characteristic of the film.

2. The method of claim 1 wherein the film of the providing step has a free shrink at 185°F in at least one of the machine or transverse directions of at least about 20% measured according to ASTM D 2732.

3. The method of claim 1 wherein the film of the providing step has a free shrink at 185°F in at least one of the machine or transverse directions of at least about 40% measured according to ASTM D 2732.

4. The method of claim 1 wherein the film of the providing step has a shrink tension at 185°F in at least one of the machine or transverse directions of at least about 100 psi measured according to ASTM D 2838 (Procedure A).

5. The method of claim 1 wherein the film of the providing step has a shrink tension at 185°F in at least one of the machine or transverse directions of at most about 250 psi measured according to ASTM D 2838 (Procedure A).

6. The method of claim 1 wherein the exposing step causes the free shrink at 220°F in at least one direction of the film to decrease by at least about 10%.

7. The method of claim 1 wherein the exposing step causes the shrink tension at 220°F in at least one direction of the film to decrease by at least about 10%.

8. The method of claim 1 wherein the radiation energy amount comprises a surface dose of non-ionizing radiation of at least about 0.01 mJ/cm2 that is delivered within a duration of at most about 30 seconds.

9. The method of claim 1 wherein the radiation energy amount comprises a surface dose of non-ionizing radiation of at least about 1 mJ/cm2 that is delivered within a duration of at most about 10 seconds.

10. The method of claim 1 wherein the radiation exposure step comprises a radiation intensity of non-ionizing radiation at the surface of the film of at least about 10 mW/cm2.

11. The method of claim 1 wherein the radiation exposure step comprises a radiation intensity of non-ionizing radiation at the surface of the film of at least about 50 mW/cm2.

12. The method of claim 1 wherein the radiation exposure step comprises a radiation intensity of non-ionizing radiation at the surface of the film of at least about 500 mW/cm2.

13. The method of claim 1 wherein the film of the providing step comprises at least one layer comprising at least about 50 % of the single-walled carbon nanotube material by weight of the total amount of single-walled carbon nanotube material in the film.

14. The method of claim 1 wherein the film of the providing step comprises a shrink layer comprising at least about 50 % of the single-walled carbon nanotube material by weight of the total amount of single-walled carbon nanotube material in the film.

15. The method of claim 1 wherein the film of the providing step comprises at least about 50 % of one or more polyolefins by weight of the film.

16. The method of claim 1 wherein the film of the providing step comprises at least about 50 % of one or more vinyl plastics by weight of the film.

17. The method of claim 1 wherein the film of the providing step is monolayer.

18. The method of claim 1 wherein the film of the providing step comprises at least three layers.

19. The method of claim 1 wherein the film of the providing step is at least about 1 mil in thickness.

20. The method of claim 1 wherein the step of exposing to the effective amount of radiation energy occurs within at most about 30 seconds.

21. The method of claim 1 wherein the step of exposing to the effective amount of radiation energy occurs within at most about 10 seconds.

22. The method of claim 1 wherein the step of exposing to the effective amount of radiation energy occurs within at most about 1 second.

23. The method of claim 1 wherein the step of exposing to the effective amount of radiation energy occurs within at most about 0.01 seconds.

24. The method of claim 1 wherein the radiation exposure step comprises exposing to an effective amount of non-ionizing radiation comprising at least about 50% visible light energy.

25. The method of claim 1 wherein the radiation exposure step comprises exposing to an effective amount of non-ionizing radiation comprising at least about 50% infrared light energy.

26. The method of claim 1 wherein the radiation exposure step comprises exposing to an effective amount of non-ionizing radiation comprising at least about 50% ultraviolet light energy.

27. The method of claim 1 wherein the effective amount of radiation energy of the exposing step is delivered discontinuously by at least two pulses.

28. The method of claim 1 wherein the film of the providing step comprises at least one layer comprising at least about 0.01 weight % single-walled carbon nanotube material by weight of the layer.

29. The method of claim 1 wherein the film of the providing step comprises at least one layer comprising at least about 0.1 weight % single-walled carbon nanotube material by weight of the layer.

30. The method of claim 1 wherein the film of the providing step comprises at least one layer comprising at least about 0.5 weight % single-walled carbon nanotube material by weight of the layer.

31. The method of claim 1 wherein the film of the providing step comprises at least one layer comprising at least about 1 weight % single-walled carbon nanotube material by weight of the layer.

32. The method of claim 1 wherein the film of the providing step comprises at least one layer comprising at least about 5 weight % of single-walled carbon nanotube material by weight of the layer.

33. The method of claim 1 wherein the exposing step structurally disrupts at least a portion of the single-walled carbon nanotube material present in the film of the providing step.

34. The method of claim 1 wherein the exposing step structurally disrupts at least about 50 weight % of the single-walled carbon nanotube material present in the film of the providing step.

35. The method of claim 1 wherein:

the film of the providing step is unperforated; and

the step of exposing of the film to the effective amount of radiation energy causes the film to be perforated with a plurality of apertures.

36. The method of claim 1 wherein:

the film of the providing step is unperforated; and

the exposing of the film to the effective amount of radiation energy does not cause the film to be perforated.

37. The method of claim 1 wherein the film comprises:

an outer layer of the film; and

one or more discontinuous regions supported by the outer layer of the film, wherein the one or more discontinuous regions comprise at least a portion of the single-walled carbon nanotube material.

38. The method of claim 1 wherein the film comprises:

an outer layer of the film; and

one or more discontinuous regions supported by the outer layer of the film, wherein the one or more discontinuous regions comprise thermoplastic polymer and at least a portion of the single-walled carbon nanotube material.

39. A film comprising one or more thermoplastic polymers and at least about 0.001 weight % of single-walled carbon nanotube material based on the weight of the film, wherein the

film has a free shrink at 185°F in at least one of the machine or transverse directions of at least about 5% measured according to ASTM D 2732.

40. The film of claim 39 wherein the film has a free shrink at 185°F in at least one of the machine or transverse directions of at least about 20% measured according to ASTM D 2732.

41. The film of claim 39 wherein the film has a free shrink at 185°F in at least one of the machine or transverse directions of at least about 40% measured according to ASTM D 2732.

42. The film of claim 39 wherein the film has a shrink tension at 185°F in at least one of the machine or transverse directions of at least about 100 psi measured according to ASTM D 2838 (Procedure A).

43. The film of claim 39 wherein the film has a shrink tension at 185°F in at least one of the machine or transverse directions of at most about 250 psi measured according to ASTM D 2838 (Procedure A).

44. The film of claim 39 further comprising at least one layer comprising at least about 50 % of the single-walled carbon nanotube material by weight of the total amount of single-walled carbon nanotube material in the film.

45. The claim of claim 39 further comprising a shrink layer comprising at least about 50 % of the single-walled carbon nanotube material by weight of the total amount of single-walled carbon nanotube material in the film.

46. The film of claim 39 further comprising at least about 50 % of one or more polyolefins by weight of the film.

47. The film of claim 39 further comprising at least about 50 % of one or more vinyl plastics by weight of the film.

48. The film of claim 39 wherein the film is monolayer.

49. The film of claim 39 wherein the film comprises at least three layers.

50. The film of claim 39 wherein the film is at least about 1 mil in thickness.

51. The film of claim 39 further comprising at least one layer comprising at least about 0.1 weight % single-walled carbon nanotube material by weight of the layer.

52. The film of claim 39 further comprising at least one layer comprising at least about 0.5 weight % single-walled carbon nanotube material by weight of the layer.

53. The film of claim 39 further comprising at least one layer comprising at least about 1 weight % single-walled carbon nanotube material by weight of the layer.

54. The film of claim 39 further comprising at least one layer comprising at least about 5 weight % of single-walled carbon nanotube material by weight of the layer.

55. A packaged object comprising:
a package comprising the film of claim 39 and defining an interior space; and
an object enclosed in the interior space of the package.

56. The packaged object of claim 55 wherein the object comprises a food product.

57. A method of packaging an object comprising:
providing the packaged object of claim 55; and
exposing the film to an amount of radiation energy effective to activate the shrink characteristic of the film.

58. A heat shrink sleeve comprising the film of claim 39.

59. A tamper-evident shrink band comprising the film of claim 39.